IOT Based Industrial Automation Using Google Assistant

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Abstract- **The proposed project focussed with the rapid development of the field of industrial control, industrial control in network applications, intelligent and distributed monitoring system requirements are also rising, and based on SN (Sensor Network) of various application systems also appear in large numbers. The intention of SN is to integrate the sensed environment parameters with the traditional network by means of a large number of sensor nodes, and the intelligent environment monitoring can be realized through the convenience of network connectivity. And the application of SN based on Arduino Environmental is development platform has become the current hot spot, which benefits from its innate advantages in hardware open source, operation performance, reliability, volume, energy consumption, cost and scalability. The Voltage, Current and Environmental temperature monitoring system based on Arduino development platform, through the use of sensors, pyrotechnic detection sensors, gas detection sensors, the corresponding characteristics of the communication system parameters monitoring, through the network monitoring parameters are transmitted to the remote server timely processed (remote data recording, remote alarm and real-time control processing), can achieve the basic security protection of communication system, improve the state of the environment monitoring and management efficiency, in order to improve the maintenance level of communication system. The entire system is controlled through Google Assist to enhance the control operations.**

Keywords- **Sensor network, IOT, Internet Protocol.**

I. INTRODUCTION

Most industries are waiting on the deployment of the low-level connected devices to enable IoT in that industry. Industrial Automation on the other hand already has over a billion connected devices deployed.

By connected devices is an end node that is Internet Protocol (IP) enabled or is directly controlled by a proxy device that is IP enabled. On a curve of connected devices needed to make IoT effective, Industrial Data processing is much higher up the curve than other industries process. That is not to say Industrial Automation is done growing with respect to IoT far from it.

There will be many more devices deployed at an increasing rate. The rate of growth will be lower with respect to some of the other industries and especially in regards to commodity device industries. The Industrial data processing and communication is rate of growth will still be impressive. Virtual assistant is boon for everyone in this new era of 21st century. It has paved way for a new technology where we can ask questions to machine and can interact with IVAs as people do with humans. This new technology attracted almost whole world in many ways like smart phones, laptops, computers etc.

Some of the significant VPs are like Siri, Google Assistant, Cortana, and Alexa. Voice recognition, contextual understanding and human interaction are the issues which are not solved yet in this IVAs. So, to solve those issues 100 users participated a survey for this research and shared their experiences. All users' task was to ask questions from the survey to all personal assistants and from their experiences this research paper came up with the actual results.

According to those results many services were covered by these assistants but still there are some improvements required in voice recognition, contextual understanding and hand free interaction. After addressing these improvements in IVAs will definitely increase its use is the main goal for this research paper [1]. Voice-based digital Assistants such as Apple's Siri and Google's Now are currently booming. Yet, despite their promise of being context-aware and adapted to a user's preferences and very distinct needs, truly personal assistants are still missing. In this paper we highlight some of the challenges in building personalized speech-operated assistive technology and

propose a number of research and development directions we have undertaken in order to solve them. In particular we focus on natural language understanding and dialog management aspects as we believe that these parts of the technology pipeline require the biggest amount of arugmentation [2].

This paper presents an implementation of wireless temperature and humidity monitoring on a Raspberry Pi. The objective of this project is to design a monitoring temperature and humidity reading kit which implemented on Raspberry Pi. The study focuses on the embedded project for sensing the temperature and humidity in room and library area. The method of analysis is performed on Raspberry Pi implementation with interfacing of a web server. Thing speak that has an API and posting and reviewing the data to the channel. Python language is encoded in Raspberry Pi Linux OS with DHT11 temperature and humidity sensor for retrieving the data.

Hence, the temperature and humidity reading implemented on Raspberry Pi has been designed and it can be concluded that the increasing in temperature indicates to decreasing of humidity levels based on the result collected [3].

This research present about Automatic temperature and humidity control system by using Fuzzy Logic algorithm for mushroom nursery. Fuzzy logic is used for analysis event in micro-controller for control device in mushroom nursery. The processes of system first is get value from temperature and humidity sensor and send data to micro-controller for analysis and control appropriate temperature and humidity by Fuzzy Logic algorithm, and send signal for control Mist sprayer and Heater. Researcher designs to experiment for 3 types of mushrooms are Straw mushroom, Angel mushroom, and Oyster mushroom in mushroom nursery size 3×5×3.5 meters. The results of this experiment are temperature and humidity control system can control appropriate temperature and humidity for 3 types of mushroom that used in experiment [4].

II. HARDWARE DESIGN

1. Power Supply Circuit:
Most of our electronic products or projects we need a power supply for converting mains AC voltage to a regulated DC voltage. For making a power supply designing of each and every component is essential. Here I'm going to discuss the designing of regulated 5V Power Supply Power supply circuit is made with Step down transformer, Voltage regulator, Capacitors and Diodes.

2. Transformer:
Selecting a suitable transformer is of great importance. The current rating and the secondary voltage of the transformer is a crucial factor.

III. PROPOSED SYSTEM

Arduino is an open-source electronics platform based on easy-to-use hardware and software. Arduino boards are able to read inputs - light on a sensor, a finger on a button, or a Twitter message - and turn it into an output - activating a motor, turning on an LED, publishing something online. You can tell your board what to do by sending a set of instructions to the microcontroller on the board. To do so you use the Arduino programming language (based on Wiring), and the Arduino Software (IDE), based on Processing. Over the years Arduino has been the brain of thousands of projects, from everyday objects to complex scientific instruments.

A worldwide community of makers - students, hobbyists, artists, programmers, and professionals - has gathered around this open-source platform, their contributions have added up to an incredible amount of accessible knowledge that can be of great help to novices and experts alike.

Arduino was born at the Ivrea Interaction Design Institute as an easy tool for fast prototyping, aimed at students without a background in electronics and programming. As soon as it reached a wider community, the Arduino board started changing to adapt to new needs and challenges, differentiating its offer from simple 8-bit boards to products for IoT applications, wearable, 3D printing, and embedded environments.

All Arduino boards are completely open-source, empowering users to build them independently and eventually adapt them to their particular needs. The software, too, is open-source, and it is growing through the contributions of user's worldwide.Advantages of Arduino Uno. The Arduino has been used in thousands of different projects and applications.
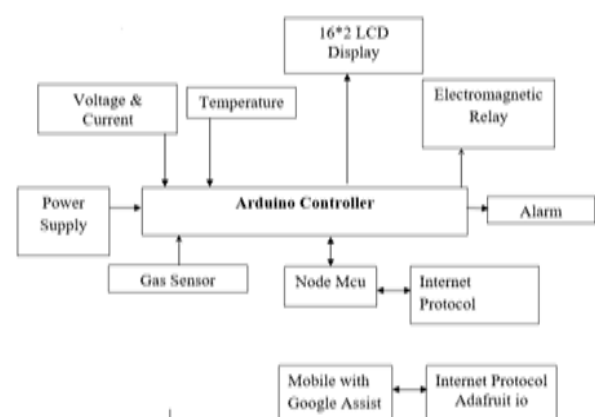

Fig 1. Block Diagram of Proposed System.

The Arduino software is easy-to-use for beginners, yet flexible enough for advanced users. It runs on Mac, Windows, and Linux. Teachers and students use it to build lowcost scientific instruments, to prove chemistry and

physics principles, or to get started with programming and robotics. Designers and architects build interactive prototypes, musicians and artists use it for installations and to experiment with new musical instruments. Makers, of course, use it to build many of the projects exhibited at the Maker Faire, for example.

Arduino is a key tool to learn new things. Anyone-children, hobbyists, artists, and programmers- can start tinkering just following the step bystep instructions of a kit, or sharing ideas online with other members of the Arduino community.

There are many other microcontrollers and microcontroller platforms available for physical computing. Parallax Basic Stamp, Netmedia's BX24, Phidgets, MIT's Handyboard, and many others offer similar functionality. All of these tools take the messy details of microcontroller programming and wrap it up in an easy-to-use package.

1. Arduino Uno- Board Description:
In this part, we will learn about the different components on the Arduino board. We will study the Arduino UNO board because it is the most popular board in the Arduino board family. In addition, it is the best board to get started with electronics and coding. Some boards look a bit different from the one, but most Arduinos have majority of these components in common.

2. NodeMCU:
NodeMCU is a standalone, ESP8266-12e based microcontroller, great for IoT projects since it has onboard Wifi. NodeMCU has two "siblings" - WeMos and Huzzah, which are pretty much the same but, are made by different manufacturers.

Common uses: The NodeMCU board is really simple to use and it can be great for making small IoT projects that don't require many components. Basically projects that are based on one or two functions. You'll definitely have a good time working with this board, it's very intuitive and simple to use.

3. IOT:
An IoT ecosystem consists of web-enabled smart devices that use embedded processors, sensors and communication hardware to collect, send and act on data they acquire from their environments. IoT devices share the sensor data they collect by connecting to an IoT gateway or other edge device where data is either sent to the cloud to be analyzed or analyzed locally.

Sometimes, these devices communicate with other related devices and act on the information they get from one another. The devices do most of the work without human intervention, although people can interact with the devices -- for instance, to set them up, give them instructions or access the data. The connectivity, networking and communication protocols used with these web-enabled devices largely depend on the specific IoT applications deployed.

IV. CONCLUSION

In this project, voice commands are given to the Google assistant. The voice commands for Google assistant have been added through IFTTT website and the Adafruit account is also linked to it. In this Industrial automation, user has given commands to the Google assistant. Industrial Parameters like Heat, Humidity and Bulb, Fan, Motor etc., are controlled according to the given commands.

The commands given through the Google assistant are decoded and then sent to the microcontroller and it controls the relays. The device connected to the respective relay turned on or OFF as per the users request to the Google Assistant. The microcontroller used is NodeMCU (ESP8266) and the communication between the microcontroller and the application is established via Wi-Fi (Internet).

An elegant way to connect families to their Industries. Operators are looking to secure their industrial environment in today's unpredictable world, and the new industrial automation service gives them the peace of mind that they need to protect their family's well-being. There are a variety of enhancements that could be made to this system to achieve greater accuracy in sensing and detection. a) There are a lot of other sensors that can be used to increase the security and control of the industries like pressure sensor that can be put outside the home to detect that pressure automationb) Changing the way of the automated notifications by using the GSM module to make this system more professional. c) A smart garage that can measure the length of the car and choose which block to put the car into it and it will navigate the car through the garage to make the parking easy for the homeowner in his garage.

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